CHAPTER 3

TYPE AND CAPACITY OF PUMPING STATIONS

3-1. Required pumping capacity. Proper selection of the number and capacity of pumping units is dependent upon the quantity and variation of wastewater flows to be handled. Except as indicated below for small stations, pumping units will be selected to handle the normal daily range of wastewater flows generated in the service area. The number and capacity of pumps provided will be sufficient to discharge the minimum, average, peak daily, and extreme peak flowrates as calculated in EM 1110-3-174. Pumping capacity will be adequate to discharge the peak flowrates with the largest pump out of service.

a. Small stations. Pumping stations required for small remote areas will be provided with two identical pumping units. Each pumping unit will be capable of discharging the extreme peak wastewater flowrate. The station will be designed to alternate between zero discharge and peak discharge. This arrangement will provide 100 percent standby capacity to allow for necessary maintenance and repairs. Pneumatic ejector stations will be provided with duplex ejectors, each sized for the extreme peak flowrate.

b. Large stations. Pumping stations serving large areas of the installation, and especially stations where the entire wastewater flow or major portions thereof must be pumped to the treatment facility, will be designed so far as practicable to operate on a continuous basis. The rate of pumpage must change in increments as the inflow to the station varies. This mode of operation will normally require two or more wastewater pumps of the constant or variable speed type, operating in single or multiple pump combinations, as required to match the incoming flowrates.

3-2. Type of construction. A classification of pumping stations by capacity and the method of construction normally utilized for that capacity is provided in table 3-1. Factory assembled pumping stations, commonly referred to as package type stations, are manufactured in standard sizes and are shipped from the factory in modules with all equipment and components mounted, installed, and ready for connection. These types of stations will be suitable for low flows and where the need to protect pumps from clogging is minimal. Conventional field erected pumping stations are designed for a particular location and to meet specific requirements. Field constructed stations will be used where the quantity of flow or its variation, or both, exceeds the capacity of available factory assembled stations or where site conditions require the use of special designs or construction methods.

Table 3-1. Classification of Pumping Stations

Class/Type	Recommended Capacity Range gpm
Factory Assembled (Package Type)	
Pneumatic Ejectors	30-200
Wet Pit Submersible Pumps	100-500
Dry Pit Pumps	100-2,000
Conventional Field Erected	
Small	300-1,500
Intermediate	1,500-10,000
Large	over 10,000

Note: Package type, dry pit pumping stations in the capacities shown are generally available off-the-shelf. However, station capacities up to 5,000 gpm can be obtained by special order.